Does the external monitoring effect of financial analysts deter corporate fraud in China?

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Jiandong Chen, Douglas Cummings, Wenxuan Hou, and Edward Lee*

Abstract

We examine whether analyst coverage influences corporate fraud in China. The fraud triangle specifies three main factors, i.e. opportunity, incentive, and rationalization. On the one hand, analysts may reduce the fraud opportunity factor through external monitoring aimed at discouraging managerial misconduct, which can moderate agency problems. On the other hand, analysts may increase the fraud incentive factor by pressurizing managers to achieve short-term performance targets, which can exacerbate agency problem. In either case, the potential influence of analysts on the fraud rationalization factor may be more pronounced among firms that are more dependent on the capital market for corporate finance. Using a sample of Chinese listed firms, we show a negative association between corporate fraud propensity and analyst coverage, and that this effect is more pronounced among non-state-owned enterprises (NSOEs), which are more reliant on the stock market for external funding. These findings suggest that analyst coverage contributes to corporate fraud deterrence in emerging economies characterized by weak investor protection. The main policy implication is that further development of the analyst profession in emerging economies may benefit investors and strengthen business ethics.

Keywords: fraud triangle; corporate fraud; agency problem; analyst coverage; China

JEL classification: G32; P37

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1. Introduction

We examine the influence of financial analyst coverage on corporate fraud among Chinese firms. Corporate fraud is a core research topic in the business ethics literature since such misconduct can generate serious negative consequences for stakeholders (Davidson and Worrell, 1988), employees (Zahra et al., 2005), and the wider society (Szwajkowski, 1985). Financial analysts are crucial to the efficiency of the capital market through their function as information intermediaries between managers and investors (Healy and Palepu, 2001). China is an aspiring emerging country with strong economic growth that is becoming increasingly reliant on the capital market, but at the same time is characterized by poor investor protection (Allen et al., 2005) and weak influence from auditing services and the business media. In such institutional environments, as are common across emerging economies, do financial analysts exert a positive or a negative effect on corporate fraud deterrence?

We contextualize the role of analysts through the conceptual framework of the fraud triangle (Cressey, 1953), i.e. opportunity, incentives, and rationalization. We argue that analysts may either reduce the opportunity or increase the incentives of managers to carry out fraud, but through either pathway the potential influence of analysts on managers' rationalization of fraud behavior will be greater among firms that are more dependent on the capital market for external funding. China provides a suitable research setting in which to examine these assertions, for two reasons. First, due to the country's weaker information environment (Piotroski and Wong, 2011), the importance of analyst coverage to the individual investors may be greater than in many other countries. Second, due to differences in government financial support across firms (Chen et al., 2010), it is easier to identify firms with a greater reliance on the capital market for corporate finance. However, the literature on corporate fraud in China has so far largely focused on internal governance mechanisms (e.g. Chen et al., 2006; Jia et al., 2009) and has paid less attention to the influence of external information intermediaries. Therefore, we contribute to the business ethics literature by providing empirical evidence from a leading emerging economy on the role of financial analysts in the fraud triangle.

Financial analysts may reduce the opportunity factor in the fraud triangle because they can serve as external monitors of managers, reducing the agency problem (Jensen and Meckling, 1976), and because their coverage may contribute to investor protection (Lang et al., 2004). Analysts are considered to be sophisticated users of financial statement information, with an industry background, experience in tracking the firm they follow, active engagement with managers to acquire information, and the expertise to detect abnormal changes in operating performance (Yu, 2008). Managers also consider the opinions of analysts to be highly important because they can influence the share price and the market value of their firms (Graham et al., 2005). In practice, there is also evidence that analysts contributed to the exposure of fraud in firms such as Compaq, Gateway, and Motorola (Dyck et al., 2010).

However, financial analyst may also increase the incentive factor in the fraud triangle because their coverage could create pressure on managers to meet performance targets (Degeorge et al., 1999), which could in turn increase the agency problem and motivate the manipulation of financial statements. Empirical evidence shows greater earnings management among firms that just meet or beat analyst earnings forecasts (Matsumoto, 2002). Existing studies also question the independence of financial analysts (Michaely and Womack, 1999; Hong and Kubik, 2003), suggest that they can be influenced by social context (Fogarty and Rogers, 2005), and document that their forecasts of firm performance tend to be optimistically biased (Boni and Womack, 2003; Chan et al., 2008).

Financial analysts also have the potential to influence the rationalization factor of the fraud triangle. Since analysts can affect the opinions of investors, managers of firms that are more reliant on external funding supplied by the capital market are expected to be more sensitive to the influence of analyst coverage. Existing studies suggest that managers make cost and benefit analyses to rationalize their decisions over whether or not to carry out corporate fraud (Hannan et al., 2006; Tsang, 2002). In firms that are more reliant on capital market funding, the cost of fraud would be greater if detected by analysts because of the negative share price response that would ensue, and the benefits of fraud could also be greater in terms of meeting and beating analyst forecasts, because the share price may

be propped up.

In the case of China, financial analysts' research is expected to be important for investors' decision making given the weak corporate information environment. For instance, Fang et al. (2014) provide empirical evidence that analyst coverage reduces audit fees in China, and that analyst influence is greater among firms with reduced or weaker auditing services. The existing literature attributes poorer transparency among Chinese firms to reasons such as poor investor protection (Morck et al., 2000) and state influence in the economy (Piotroski and Wong, 2011). Apart from this, capital market regulations associated with IPOs (Aharony et al., 2000), rights issues (Chen and Yuan, 2004), and delisting (Liu and Lu, 2007) also establish accounting performance targets that increase the motives for firms to manage earnings. Furthermore, there is low demand in China for independent and high-quality auditing services to verify financial reporting (Wang et al., 2008).

An institutional feature that could moderate the influence of analysts on the managers of Chinese firms is the financial support provided by the government in China. The existing literature (e.g. Allen et al., 2005; Chen et al., 2010) suggests that state-owned enterprises (SOEs) in China receive greater financial support through favorable loans from state banks and government subsidies than their counterparts that are non-state-owned enterprises (NSOEs). Since listed NSOEs have greater dependence on external funding from the capital market, they are expected to be more responsive and accountable to outside investors. For instance, empirical studies confirm that executive pay is more sensitive to stock return performance (Firth et al., 2006) and auditing quality has greater influence on the cost of equity capital (Chen et al., 2011) among NSOEs than SOEs.

To test our assertions about the role of financial analysts in the fraud triangle, we conduct empirical analyses on a sample of Chinese listed firms over the period of 2003 to 2008. We acquire enforcement actions against corporate fraud from the China Center for Economic Research (CCER) database. To strengthen the robustness of our analyses, we measure financial analyst coverage through three proxies, separately, i.e. the number of research reports issued for the firm, the number of analysts following the firm, and the number of brokerage houses that issue analyst reports on the firm. The number

of research reports issued gives a direct indication of the level of information supplied to the market, while the numbers of analysts and brokerage houses both indicate the degree to which the profession caters to the market demand for information about the firm. Across all these proxies, we consistently observe a significantly negative relationship between analyst coverage and corporate fraud propensity among NSOEs but not SOEs. Our findings are also robust to controls of firm characteristics, governance, and industry and regional effects. Further analyses reveal NSOEs to be associated with a more negative share price response to the announcement of corporate fraud enforcement, and this is corroborated by a greater decline in operating performance in the following year. This is consistent with NSOEs incurring more negative economic consequences upon the detection of fraud, possibly because investors assume they are more risky since the government provides them with less financial support.

Our empirical evidence suggests that, in the fraud triangle, financial analysts' effect in reducing the fraud opportunity factor is greater than their effect in increasing the fraud incentives factor. The observation that financial analysts contribute to fraud deterrence is consistent with the argument that they provide an external monitoring effect that reduces agency problems (Jensen and Meckling, 1976; Healy and Palepu, 2001). Meanwhile, our findings may also suggest that financial analyst coverage indeed has more of an influence on the fraud rationalization factor among firms that are more reliant on the capital market for funding. This implies that the cost and benefit analyses that managers apply to rationalize whether to pursue corporate fraud (Murphy and Dacin, 2011) can also be affected by corporate finance considerations.

Our findings also provide two policy implications for China and other emerging economies. First, further development of the financial analyst profession may be socially beneficial because it could promote business ethics through fraud deterrence and could strengthen capital market efficiency by improving investor confidence. For instance, this may provide justification for exchange-sponsored analyst coverage, such as that implemented in Singapore. Second, we show that state control and support of listed firms moderates their accountability to the external monitoring provided by financial analysts, which could in turn harm minority shareholder protection. In other

words, further privatization of SOEs or a reduction of the government financial support provided to such firms may be beneficial to the development of the capital market and the wider economy, in China and other countries with similar institutional backgrounds.

Our paper is organized as follows. Section 2 discusses our theoretical framework, the institutional setting, and the development of our hypotheses. Section 3 describes our sample and methodologies. Section 4 presents our empirical findings. Section 5 provides our discussion and conclusion.

2. Theories, setting, and hypotheses

2.1 Theoretical framework

The fraud triangle refers to a set of three factors that interact to determine the likelihood of corporate fraud, i.e. opportunity, incentives, and rationalization, and is credited to the seminal work of Cressey (1953). The opportunity factor is associated with the conditions or situations that enable fraud to be carried out without the risk of getting caught (Murphy and Dacin, 2011), such as the absence of controls or lack of sufficient oversight. For instance, a lack of internal governance or external scrutiny may allow managers to get away with inappropriately manipulated financial statements. The incentive factor is influenced by greed or perceived pressure to commit fraudulent behavior (Wilks and Zimbelman, 2004). Such pressure can arise for financial, professional, social, and self-esteem reasons. For instance, the need to meet an aggressive performance target can contribute to the fraud incentive. The rationalization factor provides justification for fraud and is influenced by attitude, character, values, or reasoning (Cohen et al., 2010). When opportunity and incentives exist, fraud is more likely when the managers can rationalize their self-serving gains made at the expense of the stakeholders. The fraud triangle framework is widely used by practitioners to predict the likelihood of corporate fraud, and incorporated in standards such as SAS 99 (AICPA, 2002) in the US and ISA 240 (IFAC, 2005) internationally.

Existing studies have identified variables both internal and external to organizations that may

influence the opportunity and incentive factors of the fraud triangle. Internal variables largely focus on governance characteristics and include board composition (Beasley, 1996; Dunn, 2004), top management (Baucus, 1994; Ashforth and Anand, 2003), and organizational culture (McKendall and Wagner, 1997). External variables largely focus on the environmental setting and include hostility (Baucus and Baucus, 1997), dynamism (Hansen et al., 1996), industry culture (Baucus and Near, 1991), and industry concentration (McKendall and Wagner, 1997). The rationalization factor of the fraud triangle is more often related to psychological variables. Murphy and Dacin (2011) suggest three psychological elements: awareness, intuition, and reasoning. Reasoning occurs when individuals are aware that an act is fraudulent but lack the intuition as to whether they should engage in it, and therefore carry out a cost and benefits analysis (Hannan et al., 2006; J. Tsang, 2002) to inform their decision.

Despite decades of research, there is mixed evidence on whether internal governance mechanisms contribute to corporate fraud deterrence (Berenson, 2003; Schnatterly, 2003), which makes it difficult to infer the role of these measures in the fraud triangle. For instance, Beasley (1996) finds reduced financial statement fraud among firms with more outside directors but also observes that the presence of an audit committee does not reduce fraud likelihood. Uzun et al. (2004) also observe that outside directors reduce fraud but find the presence of a nomination committee to increase the propensity of fraud. Denis et al. (2006) even observe that executive stock options can tempt managers into fraudulent behavior. Dyck et al. (2010) analyze a sample of US corporate fraud cases over the period from 1996 to 2005 and reveal that the internal governance mechanism, upon which the literature on fraud deterrence focuses, accounts for only a third of fraud detection.

Compared to internal governance mechanisms, the role of financial analysts in the fraud triangle has received relatively less attention in the literature. On the one hand, if analysts play their role as external monitors, then they are expected to reduce the fraud opportunity factor. Agency theory (Jensen and Meckling, 1976) implies that financial analyst coverage could increase firm value because it reduces agency costs by facilitating monitoring. Healy and Palepu (2001) suggest that the

private information produced by analysts could help detect managerial misuses of firm resources. Chung and Jo (1996) suggest that analyst coverage increases corporate transparency and reduces perquisite consumption, asset transfers, and fraud. On the other hand, if analysts create excess performance pressure on managers, they may contribute to the fraud incentive factor. Positive accounting theory (Watts and Zimmerman, 1986) implies that managers have incentives to manipulate financial reporting whenever accounting numbers are used as a performance benchmark. Analysts' earnings forecasts create an important threshold for managers (Dechow et al., 2003), with negative share price consequences if they are unable to meet them (Fuller and Jensen, 2002). In other words, it is theoretically possible for analyst coverage to contribute either to the reduction of opportunity or to the increase of incentives in the fraud triangle. Empirical evidence on the direction of the relationship between analyst coverage and fraud propensity can provide insights and help verify which of these two theorized effects dominates.

2.2 Institutional setting

Corporate fraud in China is likely to be motivated by two general factors. First, in a dynamic and fast-changing environment, managers are more likely to uncover opportunities to conduct fraud (Baucus and Near, 1991). For instance, the weak legal enforcement and investor protection in China (Allen et al., 2005) may not have kept up with the country's high economic growth and fast transition into a market-oriented economy, and this could have resulted in loopholes in the rules and regulations, allowing firms to behave opportunistically. Second, regulatory pressure and financial needs could provide incentives to conduct fraud (Szwajkowski, 1985). For instance, firms must make two consecutive years of profits before they can be listed on an exchange (Aharony et al., 2000), firms must achieve a minimum return on equity of 10% for three continuous years before they can issue additional shares (Chen and Yuan, 2004), and listed firms making two consecutive years of losses are placed under special treatment status, with a further year of loss seeing them suspended from trading or delisted (Jiang and Wang, 2008). These regulations are intended to guide equity capital toward well-performing firms but inevitably create incentives to manipulate reported earnings performance.

Common forms of corporate fraud among Chinese listed firms range from false statements, to delaying information disclosure, to embezzlement (Chen et al., 2005). As the primary regulator of the Chinese securities exchanges, the China Securities Regulatory Commission (CSRC) investigates and disciplines corporate fraud as part of its responsibility to oversee the capital markets. Apart from regular reviews and random inspections, the CSRC also responds to information and complaints about alleged fraud from external whistleblowers. Upon identification of fraud, the CSRC's enforcement actions can range from internal and public criticism to formal criminal prosecution. Critics have questioned the CSRC's ability to deal with fraud, especially under political pressure (Chen et al., 2005; Liebman and Milhaupt, 2008). However, similar issues also arise in developed economies such as the US; its Securities and Exchange Commission is also government funded, and is therefore also susceptible to political pressure (e.g. Correia, 2009). Existing empirical studies of corporate fraud in China reveal some evidence of the influence of internal corporate governance mechanisms. For instance, Chen et al. (2006) observe less likelihood of corporate fraud among firms with a higher proportion of non-executive directors and among those with separate persons serving as CEO and chairperson. They tentatively infer that independent directors provide a more effective monitoring role and that CEO duality encourages the abuse of managerial power. Jia et al. (2009) provide evidence that Chinese firms with larger and more active supervisory boards are likely to face more severe CSRC sanctions for fraud.

On the Shanghai and Shenzhen stock exchanges in China, the majority of the listed firms are SOEs. These firms began to be partially privatized and to issue shares that were traded on the stock exchanges in the early 1990s. Despite this, either the central government or local governments have retained sufficient shares to maintain control of these listed firms. The government exerts an influence on managerial issues such as asset disposal, mergers and acquisitions, and CEO appointments (Chen et al., 2010). Unlike the shareholder wealth maximization objective of their NSOE counterparts, the Chinese listed SOEs must carry out the socio-political objectives of the government. To support SOEs, the government provides financial assistance, which in turn reduces

the financial constraints and bankruptcy risk for such firms (Faccio et al., 2006). Financial assistance is provided through subsidies and favorable loans from state banks (Chen et al., 2008). State-owned banks often lend to SOEs for reasons other than their own profitability targets (Chen et al., 2010).

In contrast, Chinese NSOEs face substantial barriers to accessing loans from state-owned banks, and loan-granting decisions are made on a more competitive basis (Linton, 2006). Due to the lack of government financial support, NSOEs are more sensitive to the discipline of outside investors through the stock market than their SOE counterparts. Empirical studies document that NSOEs have higher stock price informativeness (Gul et al., 2010), greater accounting conservatism (Chen et al., 2010), higher-quality auditors (Wang et al., 2008), greater sensitivity of CEO turnover to share price performance (Conyon and He, 2008), and greater performance improvements following CEO turnover (Kato and Long, 2006a, b). In other words, NSOEs are expected to be more heavily influenced by investor opinion, which can in turn be influenced by analyst coverage.

2.3 Hypothesis development

We formulate testable hypotheses by intersecting the aforementioned theoretical framework and institutional setting. The theoretical framework anchors on the fraud triangle, and suggests some of the roles potentially played by analysts. It was also discussed in that section how the existing literature, which focuses on the association between internal governance mechanisms and corporate fraud, yields mixed evidence. The institutional setting highlights factors associated with fraud among Chinese listed firms, and shows that existing empirical studies of China in this area focus more on the effect of internal corporate governance mechanisms. That section also discussed differences in the financial support received from the government by Chinese SOEs and NSOEs, which render the latter more accountable to outside investors.

There are two reasons why financial analyst coverage may contribute to the reduction of the opportunity factor in the fraud triangle. First, analysts have more expertise and experience than individual investors (Lang et al., 2004), allowing them to track firm performance, identify abnormal patterns (Yu, 2008), offer early warnings, and even act as whistleblowers (Dyck et al., 2010) about

value-destroying managerial misconduct to regulatory authorities and external equity investors. In other words, analysts can alleviate the information asymmetry between managers and investors, which in turn contributes to the reduction of the agency problem (Jensen and Meckling, 1976). Second, analysts are considered as social arbiters, qualified to access a firm and its leadership (Wiesenfeld et al., 2008). Therefore, the information provided by analysts reduces, for the shareholders and boards of directors, the complexity and uncertainty associated with appraising managerial performance (Wiersema and Zhang, 2011). Assessing managerial performance is difficult because it can be confounded by organizational and environmental factors beyond managerial control (Holmstrom, 1982). Analysts can, therefore, essentially facilitate the internal governance mechanism, reducing the agency problem.

There are two reasons why financial analyst coverage may contribute to an increase in the incentives factor in the fraud triangle. First, since analysts have substantial influence over investor opinion and the share price (Givoly and Lakonishok, 1979; Frankel et al., 2006), their forecasts place excessive pressure on managers to achieve short-term performance targets (Degeorge et al., 1999) so as to avoid a negative share price response. The pursuit of short-term targets may not necessarily benefit long-run firm value, and managers are more likely to manipulate financial statements when such targets are based on accounting numbers (Watts and Zimmerman, 1986). Second, there can be a conflict of interests between analysts' role as information intermediaries and the motives of the brokerage houses that employ them, since the latter have an underwriting relationship with the firms (Dechow et al., 2000). As such, analysts may be more likely to issue biased forecasts (Veit and Murphy, 1996; Baker and Veit, 1998; Cote and Goodstein, 1999; Michaely and Womack, 1999; Hong and Kubik, 2003), which would reduce the quality of the information they provide to investors and essentially compromise their function as external monitors.

Financial analyst coverage is also expected to influence the rationalization factor of the fraud triangle. Although this factor is often assumed to be associated with the character of the manager (Evans et al., 2001), rationalizing decisions as important as corporate fraud is also expected to be

influenced by the perceived economic costs and benefits to the firm (Hannan et al., 2006; Tsang, 2002), which in turn reflect on managerial performance. As a result of analysts' influence on investor confidence and the cost of capital, firms with a greater demand for external funding supplied by the capital market are likely to be more concerned about analysts' opinions and more sensitive to the influence of analyst coverage. On the one hand, if analyst coverage reduces the fraud opportunity, then we would expect this influence to be stronger among firms with a greater need for capital market funding, due to the reinforcement effect of managerial rationalization against such misconduct. Managers of such firms are more likely to be concerned about the cost of attempting fraud in anticipation of a possibly earlier and greater investor backlash facilitated by analysts' whistleblowing. On the other hand, if analyst coverage increases the fraud incentive, then we would also expect the reinforcement effect of managerial rationalization to strengthen this effect more among firms with a greater reliance on capital market funding. Managers of such firms are more likely to be worried about the drawback of not attempting fraud, in anticipation of a negative share price response to the failure to meet short-term performance targets established by analyst forecasts.

China provides an interesting setting in which to evaluate the role of analysts in the fraud triangle. On the one hand, it has a weak corporate information environment (Piotroski and Wong, 2011), which could increase the reliance of investors on the information provided by financial analysts. If this is the case, then analyst coverage will contribute to a reduction of the fraud opportunity factor. On the other hand, China also has weak investor protection (Allen et al., 2005), which could increase the agency problem and the managerial pursuit of short-term targets under analyst pressure. If this is the case, then analyst coverage will contribute to an increase of the fraud incentive factor. In terms of the influence of analyst coverage on the fraud rationalization factor, which we argue to be greater among firms with more dependence on capital market funding, we expect this to be more pronounced among NSOEs than SOEs as a result of the smaller amount of government financial support received by the former group of listed firms. Based on the aforementioned arguments, we formulate the following testable hypotheses:

H1a: Analyst coverage reduces the propensity for corporate fraud among listed NSOEs but not their SOE counterparts in China.

H1b: Analyst coverage increases the propensity for corporate fraud among listed NSOEs but not their SOE counterparts in China.

If we observe empirical evidence consistent with hypothesis H1a but not H1b, then this will imply that analyst coverage exerts a positive influence on fraud deterrence in China, possibly because of the decrease in the opportunity factor outweighing the increase in the incentives factor in the fraud triangle. Alternatively, if we find evidence consistent with hypothesis H1b but not H1a, then this will suggest that analyst coverage impedes fraud deterrence in China, possibly due to the increase in the incentives factor dominating the decrease in the opportunity factor in the fraud triangle. The observation that the analyst impact on fraud propensity exists mainly in NSOEs rather than SOEs will imply that there is a reinforcement effect among firms with greater capital demands, possibly through the rationalization factor of the fraud triangle.

There is one caveat to the interpretation that any contrast in findings between NSOEs and SOEs will be due to differences in the rationalization factor between these groups. It may instead simply be due to the greater impact of either the opportunity reduction or incentive increase among NSOEs. However, if the reduction of the fraud opportunity caused by analyst coverage is simply greater in NSOEs than SOEs, this will either suggest that analysts systematically provide less competent research on SOEs, or that investors in SOEs are generally less reliant on analysts as an information source. In either case, it would be difficult for the analysts of SOEs to justify their services to investors. Alternatively, if the increase in fraud incentives caused by analyst coverage turns out to simply be greater in NSOEs than SOEs, this will mean that the analysts of NSOEs systematically set higher performance targets that are more difficult for the managers of such firms to meet and beat. If

this is the case, firms are likely to frequently miss the performance targets established by analysts, which would imply that such analysts are systematically optimistic and would undermine their credibility. In other words, we argue that the differential effect of analyst coverage on fraud propensity between NSOEs and SOEs is likely to be influenced by the rationalization factor in the fraud triangle.

Our hypotheses H1a and H1b are based on the assumption that Chinese listed NSOEs are more concerned about the opinion of external equity investors regarding corporate fraud than are the SOEs. An interesting research question that stems from this is whether external equity investors respond differently to the corporate fraud events of NSOEs relative to those of SOEs. Agency theory implies that corporate fraud signals to the market that firms have untrustworthy executives or ineffective governance mechanisms. The agency problem reduces expected future cash flow prospects or increases the discount rate due to the uncertainty about such firms, which in turn leads to a decline in the share price. Despite the agency costs for fraud-committing firms, SOEs are likely to receive greater government financial support and face less default risk than NSOEs. In other words, investors are likely to perceive the post-fraud performance of SOEs to be more likely to recover and less likely to deteriorate than that of NSOEs. As such, we expect the share price response to a fraud event to be more negative and subsequent operating performance to be worse for NSOEs than their SOE counterparts. As a result of government financial assistance, SOEs are also more likely to recover from the difficulties associated with corporate fraud than are NSOEs. Therefore we hypothesize that:

H2: Stock market reactions to corporate fraud announcements are more negative among listed NSOEs than their SOE counterparts in China.

H3: Operating performance following corporate fraud is lower among listed NSOEs than their SOE counterparts in China.

The existing literature suggests that, in an efficient capital market, stock price movements should reflect information about future earnings (e.g. Beaver et al., 1980; Ayers and Freeman, 2000). Thus, if we find empirical evidence that supports both hypotheses H2 and H3, this will imply that the asymmetrically more negative market reactions following corporate fraud among NSOEs are a rational response from investors to the subsequent performance they expect of the firms. Alternatively, if we find evidence in support of hypothesis H2 but not H3, then this may indicate that the investors have responded to corporate fraud events irrationally, possibly driven by rumors or herding.

3. Sample and methodology

3.1 Test of hypotheses H1a and H1b

To test hypotheses H1a and H1b, which predict a negative relationship between corporate fraud propensity and financial analyst coverage, we apply logistic regression analyses based on Equation 1 below:

$$\begin{aligned} Fraud_{i,t} = {} & \alpha_0 + \alpha_1 Coverage_{i,t-1} + \alpha_2 NSOE_{i,t-1} + \alpha_3 Coverage_{i,t-1} \times NSOE_{i,t-1} \\ & + \alpha_4 Size_{i,t-1} + \alpha_5 Growth_{i,t-1} + \alpha_6 ST_{i,t-1} + \alpha_7 Foreign_{i,t-1} \\ & + \alpha_8 InstOwn_{i,t-1} + \alpha_9 OwnCon_{i,t-1} + a_{10} Duality_{i,t-1} \\ & + a_{11} Bmeet_{i,t-1} + a_{12} Bsize_{i,t-1} + \alpha_{13} BIndep_{i,t-1} + a_{14} SBsize_{i,t-1} \\ & + Industry + Area + \varepsilon_{i,t} \end{aligned} \quad (1)$$

The dependent variable *Fraud* equals 1 if enforcement actions against corporate fraud occurred in the fiscal year in question and 0 otherwise. All independent variables are measured at the previous fiscal year end. *Coverage* is separately proxied by the number of financial analysts following the firm, the number of analyst reports issued for the firm, and the number of brokerage house that issue analyst reports on the firm. *NSOE* equals 1 if the firm is a non-state-owned enterprise and 0 otherwise. *Size* is

firm size measured as the log of market capitalization. *Growth* is firm growth measured as the price-to-book ratio. *ST* equals 1 for firms under special treatment (i.e. those with two consecutive years of losses) and 0 otherwise. *Foreign* equals 1 if the proportion of shares held by foreign shareholders is above the yearly cross-sectional median and 0 otherwise. *InstOwn* equals 1 if the proportion of shares held by mutual funds is above the yearly cross-sectional median and 0 otherwise. *OwnCon* is the ownership concentration, measured by the Herfindahl index and based on the ownership held by the ten largest shareholders in the firm. *Duality* equals 1 for firms with CEO also serving as board chairman and 0 otherwise. *Bmeet* equals 1 for firms with above the yearly cross-sectional median number of board meetings and 0 otherwise. *Bsize* equals 1 for firms with board size above the yearly cross-sectional median and 0 otherwise. *Bindep* equals 1 for firms whose proportion of independent directors is above the yearly cross-sectional median and 0 otherwise. *SBsize* equals 1 for firms with supervisory board size above the yearly cross-sectional median and 0 otherwise. To control for industry effects, we define sector according to the first two digits of the Global Industry Classification Standards (GICS). To control for regional effects, we follow Firth et al. (2006) and classify firms into four different regions based on their level of economic and institutional development.

The coefficient α_1 indicates the relationship between fraud propensity and analyst coverage among SOEs. The coefficient α_3 indicates the incremental relationship between fraud propensity and analyst coverage among NSOEs. If $\alpha_3 < 0$ and is statistically significant, this will indicate that analyst coverage reduces corporate fraud significantly more among NSOEs than SOEs, which will be consistent with hypothesis H1a. In other words, we will have evidence suggesting that analyst coverage reduces the opportunity factor, and that the effect is possibly reinforced by the rationalization factor in the fraud triangle. Alternatively, if $\alpha_3 > 0$ and is statistically significant, this will suggest that analyst coverage increases corporate fraud significantly more among NSOEs than SOEs, which will be consistent with hypothesis H1b. This will provide evidence that analyst coverage increases the incentive factor, with the influence possibly reinforced by the rationalization

factor in the fraud triangle.

3.2 Test of hypotheses H2 and H3

To test hypotheses H2 and H3, which predict that the share price response to fraud events is more negative and earnings performance following fraud is lower among NSOEs, we implement the following regression analyses in the corporate fraud sub-sample:

$$\begin{aligned} CAR_{i,t} = {} & \beta_0 + \beta_1 NSOE + \beta_2 Size_{i,t-1} + \beta_3 Growth_{i,t-1} + \beta_4 ST_{i,t-1} \\ & + \beta_3 Foreign_{i,t-1} + \beta_4 InstOwn_{i,t-1} + \beta_5 OwnCon_{i,t-1} \\ & + \beta_6 Duality_{i,t-1} + \beta_7 Bmeet_{i,t-1} + \beta_8 Bsize_{i,t-1} + \beta_9 BIndep_{i,t-1} \\ & + \beta_{10} SBsize_{i,t-1} + \varepsilon_{i,t} \end{aligned} \tag{2}$$

$$\begin{aligned} Perf_{i,t} = {} & \gamma_0 + \gamma_1 NSOE + \gamma_2 Size_{i,t-1} + \gamma_3 Growth_{i,t-1} + \gamma_4 ST_{i,t-1} \\ & + \gamma_3 Foreign_{i,t-1} + \gamma_4 InstOwn_{i,t-1} + \gamma_5 OwnCon_{i,t-1} \\ & + \gamma_6 Duality_{i,t-1} + \gamma_7 Bmeet_{i,t-1} + \gamma_8 Bsize_{i,t-1} + \gamma_9 BIndep_{i,t-1} \\ & + \gamma_{10} SBsize_{i,t-1} + \varepsilon_{i,t} \end{aligned} \tag{3}$$

The dependent variable of Equation 2 is the cumulative abnormal return (*CAR*) around the announcement day of the enforcement action against corporate fraud. We calculate abnormal returns as the firm-specific return less the market index return, either on day 0 or over a five-day window (–2 to +2) around the event. All other variables are defined as in Equation 1. A coefficient $\beta_1 < 0$ will indicate that NSOEs are associated with more negative stock returns upon the disclosure of corporate fraud than their SOE counterparts, which will be consistent with our hypothesis H2. It is worth noting that there is a time period between the announcement of the beginning of an investigation and the announcement of enforcement action, and some of the information regarding the investigation may already have been incorporated into the share price by the time of the latter. If the market anticipates the full outcome of the investigation, then the announcement of enforcement action may not contain

new price-sensitive information. However, if this is true, then our focus on the announcement of enforcement action will only bias against us finding evidence consistent with our hypothesis. The dependent variable of Equation 3 is earnings performance in the fiscal year following enforcement action against corporate fraud. We apply either raw or industry-adjusted earnings per share. Obtaining coefficient $\gamma_1 < 0$ will indicate that NSOEs are associated with lower earnings performance in the year after corporate fraud than are their SOE counterparts, which will be consistent with our hypothesis H3.

3.3 Sample description

To carry out our empirical analyses, we obtain the archival data required for our analyses from either CCER (China Centre for Economic Research) or CSMAR (China Stock Market and Accounting Research). These data include whether regulatory enforcement action against corporate fraud is disclosed, the firms' ownership status, the firms' characteristics and performance, as well as the firms' corporate governance variables. We identify 409 fraud cases over the six-year sample period of 2003 to 2008 for which valid data for all other variables required in our analysis are available.

Table 1 presents the summary statistics of the variables used in our empirical analyses. Corporate fraud cases (*Fraud*) account for 4.5% of our total number of firm-year observations. Within our sample the average number of analyst reports issued to a firm (*Report*) is 4.481 per year, the average number of analysts following a firm (*Analysts*) is 2.872 per year, and the average number of brokerage houses that issue analyst reports on a firm (*Broker*) is 3.766 per year. Non-state-owned enterprises (*NSOE*) account for nearly a third of all our observations. The average firm size based on market capitalization (*Size*) is over 845 million RMB and, on average, this is three times the book value of the firms as indicated by the market-to-book ratio (*Growth*). Around 10% of all our observations are classified as special treatment (*ST*), i.e. firms that have reported two consecutive years of losses. While 7% of firms in our sample have foreign ownership, less than 3% have mutual fund ownership.

[insert Table 1 here]

Table 2 presents the correlation analysis of the variables used in our study. *Fraud* has significantly negative correlation with the three analyst coverage variables: *Report*, *Analyst*, and *Broker*. It is also significantly higher among listed NSOEs, possibly because such firms have less government financial support and thus resort to fraud more often, perhaps to fulfil the stock exchange listing rules or to meet investor expectations. Firms that are smaller, have higher growth, or suffer losses tend to have more information asymmetry and therefore commit fraud more frequently. Mutual fund ownership is significantly correlated with fewer fraud cases, which implies that institutional investors exert a monitoring effect on firms. Ownership concentration also reduces corporate fraud, possibly because large block shareholders have more influence to discipline firms. Finally, firms with boards of directors that meet more frequently have less fraud, which is consistent with the board playing an internal governance function.

[insert Table 2 here]

4. Empirical findings

4.1 Test of hypotheses H1a and H1b

Table 3 presents the logistic regression analyses of the relationship between corporate fraud propensity and financial analyst coverage, which is separately proxied by three measures, i.e. number of analysts following, number of reports issued, and number of brokerage houses. The coefficient for *Coverage*, which indicates the influence of analyst coverage on SOEs, is statistically insignificant for two out of three measures. This indicates that among the listed SOEs there is no robust evidence that variations in analyst coverage influence their propensity to commit fraud. The coefficient for *NSOE*, which indicates the propensity to commit fraud among NSOEs without analyst coverage, is significantly positive for all three measures of analyst coverage. For instance, using the number of

analysts following as the proxy for coverage, the coefficient of this variable is 0.257 (t-stat = 3.16). This observation suggests that NSOEs are more likely to commit fraud than SOEs when there is no following by analysts. One possible reason for this is that NSOEs enjoy less government support and the managers of such firms are less accountable to government discipline.

[insert Table 3]

In Table 3, the coefficient for *Coverage* × *NSOE* indicates the incremental effect of analyst coverage on fraud propensity among NSOEs. Notice that this coefficient is consistently and significantly negative under all three measures of analyst coverage. For instance, using the number of reports to measure coverage, the coefficient is -0.079 (t-stat = -2.17). This suggests that NSOEs with higher analyst coverage have an incrementally lower likelihood to commit fraud, which is consistent with our hypothesis H1a and not with H1b. In other words, the net effect of analyst coverage among Chinese listed firms is the reduction of the opportunity factor rather than the increase of the incentive factor in the fraud triangle, and this impact exist only in NSOEs, possibly because of their dependence on capital market funding, which reinforces the analyst coverage effect through the managerial rationalization factor in the fraud triangle.

Our findings are robust to the control of various firm characteristics and corporate governance variables, as well as industry and regional effects. Throughout Table 3, we observe a consistent and significant relationship between corporate fraud propensity and *Size*, *ST*, *OwnCon*, and *Bmeet*. The negative coefficient for *Size* and the positive coefficient for *ST* suggest that smaller and loss-making firms are more likely to commit corporate fraud, possibly because they have more information asymmetry or are in financial distress. The negative coefficients for *OwnCon* and *Bmeet* indicate that firms with more concentrated ownership and more frequent board meetings are less likely to commit fraud. This suggests that the internal governance mechanisms provided by blockholders and boards of directors have some effect in curbing fraud in both SOEs and NSOEs.

An alternative interpretation of this finding could be that analysts choose to cover firms they deem less likely to commit fraud. However, this does not explain why our findings exist only in NSOEs and not SOEs. It is difficult to substantiate the argument that analysts are selective only in NSOEs because analysts would lose credibility if they could not provide early warnings of fraud among SOEs as well. Furthermore, as indicated in our Equation 1, we apply a lead-lag approach by regressing the fraud variable for year *t,* on analyst coverage and other control variables in year *t*-1. This specification may reduce the likelihood that analyst coverage is reversely determined by fraud propensity, and may also reduce concerns over endogeneity between these variables. Finally, we also carry out Heckman two-stage analyses, as discussed later in Section 4.3.

4.2 Test of hypotheses H2 and H3

Table 4 presents our results from the test of hypothesis H2, which predicts that the stock market reacts more negatively to corporate fraud enforcement announcements among NSOEs than SOEs. In Panel A we observe that the listed SOEs are associated with a 0.7% decline in value, relative to the market index on day 0 when enforcement action against their fraudulent behavior was disclosed. On the other hand, the NSOEs are associated with a 1.7% decline in value relative to the market portfolio upon the announcement of enforcement action. The difference between the two is statistically significant, and a similar pattern is observed when we use a longer, five-day (–2, +2) event window. Panel B shows that, based on the day 0 abnormal returns and those from the five-day window, the coefficients pertaining to *NSOE* are –0.012 (t-stat = –2.56) and –0.022 (t-stat = –1.79) respectively. This further confirms that the market reaction to corporate fraud is more negative among NSOEs than their SOE counterparts, after controlling for various firm characteristics and corporate governance variables. On the whole, Table 4 is consistent with our prediction in hypothesis H2 that NSOEs incur more negative economic consequences following corporate fraud. This is consistent with external investors anticipating lower cash flow prospects or attaching a higher discount rate to NSOEs following news of corporate fraud, possibly because the lack of government financial support makes

it more difficult for NSOEs to recover.

[insert Table 4]

Table 5 reports our test of hypothesis H3, which predicts that the operating performance in the year following corporate fraud will be lower among NSOEs than SOEs. Indeed, both Panels A and B reveal that the NSOEs' raw and industry-median-adjusted earnings per share are significantly lower than those of their SOE counterparts one year after the respective corporate fraud events, which is consistent with our prediction in hypothesis H3. Mistrust and loss of reputation affects fraud-committing firms' ability to acquire external capital. This may affect their ability to fund operations and investment, which would in turn reduce recovery and prolong the deterioration of performance. With less government financial support, a negative impact such as this is likely to be greater among NSOEs. The observation in Table 5 of significantly lower earnings performance among NSOEs following fraud also suggests that the more negative market reaction to such firms following enforcement actions against fraud is a rational anticipation of lower future cash flows and greater performance uncertainty.

[insert Table 5]

4.3 Additional tests

To strengthen the rigor and robustness of our findings consistent with hypothesis H1a, we carry out four sets of additional tests.[1] First, we apply Heckman's two-step regression approach to address a possible sample selection issue, i.e. that analysts may not choose which firms to follow randomly. In the first step, we model analyst coverage based on various firm characteristics, and obtain the inverse

[1] We gratefully appreciate the two reviewers for suggesting these additional tests, which enhance the robustness of our main findings.

Mills ratio. In the second step, we incorporate the inverse Mills ratio into our main regression test. The results, which are untabulated for brevity, include a coefficient on *NSOE* of 0.225 (t-stat = 3.86) and a coefficient on *Coverage* × *NSOE* of -0.076 (t=stat = -3.19). This indicates that NSOEs with no analyst coverage have a higher fraud propensity than SOEs, and analyst coverage leads to an incrementally lower fraud propensity among such firms, which is broadly similar to our main results reported in Table 3. Second, to account for the potential effect of non-tradable shares, we incorporate the ratio of tradable to total shares as an additional control variable. Variations in the proportion of tradable shares may influence firms' sensitivity to share price movements in the capital market. This set of tests, the results of which are again untabulated for brevity, yields similar inferences to those of the main findings reported in Table 3. For instance, using the number of analysts as the measure for coverage, and in the presence of the ratio of tradable shares as an additional control, the coefficient on *NSOE* is 0.256 (t-stat = 3.15) and the coefficient on *Coverage* × *NSOE* is -0.096 (t=stat = -1.87). Third, we also carry out sensitivity analyses, which are once again untabulated for brevity, by excluding firms with zero analyst coverage. This enables us to observe whether the findings consistent with hypothesis H1a are indeed driven by cross-sectional variations in the level of analyst coverage, or are instead driven by whether the firm has analyst coverage or not. Across all three measures of analyst coverage, we obtain evidence broadly similar to our main findings in Table 3, even after excluding zero-coverage observations. Finally, to account for the identification problem due to the possibility that some firms may have committed fraud but have yet to be detected, we perform tests using a bivariate probit model with partial observability, following Chen et al. (2006). The results, again untabulated for brevity, suggest that the coefficients on the interactions between analyst coverage and the NSOE variables are significantly negative, which is consistent with our inferences from Table 3. Overall, our findings in line with the prediction in hypothesis H1a are robust to these additional tests.

5. Discussion and conclusion

Do financial analysts play a role in the fraud triangle? Using a sample of Chinese listed firms, we provide empirical evidence that financial analyst coverage is inversely associated with corporate fraud propensity, and especially among listed NSOEs. This implies that analysts contribute to the reduction of the opportunity factor in the fraud triangle, and the effect is more pronounced among firms receiving less government support and depending more on the capital market for external funding. This is consistent with firms that are more concerned about outside investor opinion being more sensitive to the external monitoring effect of financial analysts. Further analyses reveal that NSOEs are indeed associated with more negative market reactions upon the announcement of corporate fraud enforcement action by the regulatory authority. This is consistent with the dependence on the capital market for financing making it more costly for NSOEs to commit fraud due to the mistrust and loss of reputation that ensues from the discovery of such misconduct. We also provide evidence that NSOEs underperform their SOE counterparts in terms of operating performance following fraud. The observation that the performance of NSOEs declines more or recovers less after fraud corroborates such firms' more negative share price response to the announcement of fraud. Our empirical findings are robust to controls of firm characteristics, corporate governance variables, industry and regional effects, as well as other sensitivity analyses.

The fraud triangle is widely used by the auditing profession to evaluate the likelihood of financial statement fraud (AICPA, 2002; IFAC, 2005), often through firms' internal features associated with governance mechanisms and managerial characteristics. We adopt the fraud triangle as the conceptual framework of our study so as to rationalize and contextualize the influence of financial analysts, which is an external determinant that can affect each of the three factors, i.e. opportunity, incentives, and rationalization, in different ways. On the one hand, some of the existing literature (Jensen and Meckling, 1976; Healy and Palepu, 2001) argues that financial analysts play a role as external monitors, reducing the agency cost of firms by reducing the information asymmetry that arises from the separation of ownership and control. Since corporate fraud is a manifestation of the agency problem, it is possible to argue that analyst coverage could contribute to the reduction of

the fraud opportunity factor. On the other hand, other existing work (Watts and Zimmerman, 1986) argues that managers have incentives to alter the financial statements whenever their performance appraisal is based on accounting numbers. Since analysts provide performance forecasts about firms, and whether firms meet or beat these targets can affect market value (Degeorge et al., 1999), analysts inevitably create performance pressure for managers and contribute to the increase of the fraud incentives factor. As for the fraud rationalization factor, the influence of analysts through either of the aforementioned pathways may at least partly depend on the degree to which a manager is concerned about investor opinion.

As such, we contribute to the literature by highlighting how fraud triangle components such as the opportunity and incentive factors can be externally influenced. Since there is mixed evidence from existing research on the relationship between internal governance mechanisms and corporate fraud (Berenson, 2003; Schnatterly, 2003), variations in the propensity for such misconduct may be driven by other variables, and our study shows that the external effect from financial analysts is relevant. This may have practical implications for the fraud detection efforts of the auditing profession, because it could further increase its consideration of analyst-related features such as coverage, forecasted earnings, and affiliations with firms. In terms of policy implications, our findings imply that strengthening the analyst profession and its influence on the capital market in emerging economies such as China where there is a weak corporate information environment may be useful. For instance, independent analysts sponsored by regulatory agencies or stock exchanges may benefit investors, as long as such an approach would not create excess pressure on firms to meet and beat analyst forecasts. We also contribute to the literature by suggesting how the rationalization factor in the fraud triangle may be determined by managers' economic reasoning (Hannan et al., 2006; Tsang, 2002) in additional to the psychological and cultural elements that influence managerial behavior. Since the demand for external financing through the capital market as opposed to government support makes the managers of Chinese NSOEs more sensitive to the external monitoring effect than their SOE counterparts, one possible avenue for further study would be to

examine whether the likelihood of CEO turnover following fraud is also greater among NSOEs than SOEs (Chen et al., 2014).

Our findings also imply possible effects from institutional investors, the business media, and the regulatory environment on the fraud triangle factors. For instance, there is evidence of a higher likelihood to commit fraud among Chinese firms cross-listed in the US (Wang, 2012). From the perspective of the fraud triangle, a better regulatory environment in the US exchanges should reduce the fraud opportunity factor for Chinese firms. However, it appears that the pressure to meet US investor expectations and the requirements of the US exchanges may increase the fraud incentive factor for these Chinese cross-listing firms. The role of analysts in the fraud triangle may perhaps also vary across regions within China, due to variations in institutional development. This is why we controlled for regional effects in our empirical analyses, but such an influence could certainly be studied further in future research.

Our evidence that analysts' role in the fraud triangle may be moderated by state support of listed firms has policy implications for China and other emerging economies with similar institutional features. The existing literature suggests that political connections and government support, such as those enjoyed by Chinese SOEs, can be beneficial for firms in terms of performance and competition (Davis et al., 1997; Tsang, 1998). The rationale is that such connections and support compensate for insufficient infrastructure and the uncertain business environment (Atuahene-Gima and Li, 2002; Xin and Pearce, 1996). In our case, we confirm that government support for SOEs reduces the negative economic consequences experienced by those firms, compared to NSOEs, in the context of corporate fraud. However, the flip side is that it also reduces the effectiveness of external scrutiny exerted by financial analysts. This will not necessarily be beneficial for the minority shareholders of SOEs, which still account for the majority of listed firms on Chinese stock exchanges. The disadvantage to the minority investors is further exacerbated by the weak investor protection and information environment that characterizes the Chinese capital market (Allen et al., 2005).

The efficient allocation of financial resources is a key determinant of economic development and

growth. Therefore, investor confidence in the capital market plays a vital role in the efforts of China and other emerging economies to develop sustainable economic growth. The experiences in developed Western countries over the past decade, from corporate scandals to financial crisis, have revealed the importance of corporate stewardship and governance to the efficiency of the capital market and the wider society. Therefore, developing and strengthening external governance mechanisms through sources such as financial analysts may strengthen investor confidence and business ethics, which will in turn enhance financial market liquidity. Our study provides insights from this perspective.

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Table 1: Summary statistics

This table presents the summary statistics of the variables used in our analysis. Our sample period covers 2003 to 2008. *Fraud* equals 1 if enforcement actions against corporate fraud occurred in the current fiscal year and 0 otherwise. *Report* is the number of analyst reports issued for the firm. *Analyst* is the number of financial analysts following the firm. *Broker* is the number of brokerage houses that issue analyst reports on the firm. *NSOE* equals 1 if the firm is a non-state-owned enterprise and 0 otherwise. *Size* is firm size measured as the log of market capitalization. *Growth* is firm growth measured as the price-to-book ratio. *ST* equals 1 for firms under special treatment (i.e. those with two consecutive years of losses) and 0 otherwise. *Foreign* equals 1 if the proportion of shares held by foreign shareholders is above the yearly cross-sectional median and 0 otherwise. *InstOwn* equals 1 if the proportion of shares held by mutual funds is above the yearly cross-sectional median and 0 otherwise. *OwnCon* is ownership concentration, measured by the Herfindahl index and based on the ownership held by the ten largest shareholders in the firm. *Duality* equals 1 for firms with CEO also serving as board chairman and 0 otherwise. *Bmeet* equals 1 for firms with above the median number of board meetings and 0 otherwise. *Bsize* equals 1 for firms with board size above the cross-sectional median and 0 otherwise. *Bindep* equals 1 for firms whose proportion of independent directors is above the cross-sectional median and 0 otherwise. *SBsize* equals 1 for firms with supervisory board size above the cross-sectional median and 0 otherwise.

Variables	Mean	Std.dev.	Median	Obs.
Fraud	0.045	0.208	0.000	8274
Report	4.481	10.447	0.000	8274
Analyst	2.872	5.585	0.000	8274
Broker	3.766	6.111	1.000	8274
NSOE	0.334	0.472	0.000	8274
Size	20.556	1.082	20.408	8274
Growth	3.451	3.971	2.344	8274
ST	0.092	0.289	0.000	8274
Foreign	0.070	0.255	0.000	8274
InstOwn	0.026	0.060	0.000	8274
OwnCon	0.196	0.131	0.161	8274
Duality	0.010	0.099	0.000	8274
Bmeet	0.573	0.495	1.000	8274
Bsize	0.372	0.483	0.000	8274
Bindep	0.883	0.321	1.000	8274
SBsize	0.888	0.315	1.000	8274

Table 2: Correlation analysis

This table presents the correlation analysis of the variables used in our analysis. Our sample period covers 2003 to 2008. *Fraud* equals 1 if enforcement actions against corporate fraud occurred in the current fiscal year and 0 otherwise. *Report* is the number of analyst reports issued for the firm. *Analyst* is the number of financial analysts following the firm. *Broker* is the number of brokerage houses that issue analyst reports on the firm. *NSOE* equals 1 if the firm is a non-state-owned enterprise and 0 otherwise. *Size* is firm size measured as the log of market capitalization. *Growth* is firm growth measured as the price-to-book ratio. *ST* equals 1 for firms under special treatment (i.e. those with two consecutive years of losses) and 0 otherwise. *Foreign* equals 1 if the proportion of shares held by foreign shareholders is above the yearly cross-sectional median and 0 otherwise. *InstOwn* equals 1 if the proportion of shares held by mutual funds is above the yearly cross-sectional median and 0 otherwise. *OwnCon* is ownership concentration measured by the Herfindahl index and based on the ownership held by the ten largest shareholders in the firm. *Duality* equals 1 for firms with CEO also serving as board chairman and 0 otherwise. *Bmeet* equals 1 for firms with an above median number of board meetings and 0 otherwise. *Bsize* equals 1 for firms with board size above the cross-sectional median and 0 otherwise. *Bindep* equals 1 for firms whose proportion of independent directors is above the cross-sectional median and 0 otherwise. *SBsize* equals 1 for firms with supervisory board size above the cross-sectional median and 0 otherwise. * indicates statistical significance at the 5% level.

	Fraud	Report	Analyst	Broker	NSOE	Size	Growth	ST	Foreign	InstOwn	OwnCon	Duality	Bmeet	Bsize	Bindep	SBSize
Fraud	1.000															
Report	-0.064*	1.000														
Analyst	-0.077*	0.968*	1.000													
Broker	-0.089*	0.742*	0.941*	1.000												
NSOE	0.061*	-0.009	-0.009	0.001	1.000											
Size	-0.107*	0.515*	0.546*	0.576*	-0.142*	1.000										
Growth	0.026*	0.015	0.016	0.021	0.071*	0.160*	1.000									
ST	0.123*	-0.115*	-0.134*	-0.157*	0.112*	-0.231*	0.166*	1.000								
Foreign	-0.013	0.038*	0.051*	0.067*	0.088*	0.018	0.001	-0.021	1.000							
InstOwn	-0.067*	0.572*	0.594*	0.628*	-0.007	0.477*	0.111*	-0.113*	0.011	1.000						
OwnCon	-0.071*	0.026*	0.031*	0.047*	-0.272*	0.005	-0.047*	-0.110*	-0.048*	-0.057*	1.000					
Duality	-0.004	0.028*	0.017	0.006	0.039*	0.009	0.015	0.029*	0.027	0.008	-0.043*	1.000				
Bmeet	-0.057*	-0.038*	-0.034*	-0.025*	-0.067*	-0.053*	-0.038*	-0.053*	0.019	-0.030*	0.045*	-0.017	1.000			
Bsize	-0.010	-0.010	-0.010	-0.029*	-0.117*	0.066*	-0.039*	-0.052*	0.051*	0.006	0.029*	0.009	0.050*	1.000		
Bindep	-0.019	0.072*	0.087*	0.111*	0.133*	0.034*	-0.060*	0.002	0.029*	0.130*	-0.082*	-0.005	-0.040*	-0.001	1.000	
SBSize	-0.018	0.013	0.007	-0.006	-0.107*	0.077*	-0.008	-0.044*	-0.032*	-0.001	0.028*	-0.026*	-0.022	0.052	-0.003	1.000

Table 3: Relation between fraud and analyst coverage (test of hypotheses H1a and H1b)

This table presents the logistic regression analysis of the relationship between corporate fraud propensity and financial analyst coverage. Our sample period covers 2003 to 2008. The dependent variable *Fraud* equals 1 if enforcement actions against corporate fraud occurred in the current fiscal year and 0 otherwise. *Coverage* is separately measured by the number of analysts following, the number of reports issued, and the number of brokerage houses. *NSOE* equals 1 if the firm is a non-state-owned enterprise and 0 otherwise. *Size* is firm size measured as the log of market capitalization. *Growth* is firm growth measured as the price-to-book ratio. *ST* equals 1 for firms under special treatment (i.e. those with two consecutive years of losses) and 0 otherwise. *Foreign* equals 1 if the proportion of shares held by foreign shareholders is above the yearly cross-sectional median and 0 otherwise. *InstOwn* equals 1 if the proportion of shares held by mutual funds is above the yearly cross-sectional median and 0 otherwise. *OwnCon* is ownership concentration measured by the Herfindahl index and based on the ownership held by the ten largest shareholders in the firm. *Duality* equals 1 for firms with CEO also serving as board chairman and 0 otherwise. *Bmeet* equals 1 for firms with an above median number of board meetings and 0 otherwise. *Bsize* equals 1 for firms with board size above the cross-sectional median and 0 otherwise. *Bindep* equals 1 for firms whose proportion of independent directors is above the cross-sectional median and 0 otherwise. *SBsize* equals 1 for firms with supervisory board size above the cross-sectional median and 0 otherwise. Our t-statistics are adjusted for heteroskedasticity. *, **, and *** indicate the 10%, 5%, and 1% levels of significance respectively.

	Number of analysts following		Number of analyst reports		Number of brokerage houses	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Coverage	-0.027	(-1.03)	-0.003	(-0.22)	-0.036*	(-1.70)
NSOE	0.257***	(3.16)	0.264***	(3.30)	0.269***	(3.27)
Coverage × NSOE	-0.098*	(-1.86)	-0.079***	(-2.17)	-0.068**	(-1.99)
Size	-0.198***	(-4.74)	-0.209***	(-4.96)	-0.186***	(-4.41)
Growth	0.008	(1.19)	0.009	(1.24)	0.008	(1.13)
ST	0.361***	(4.44)	0.364***	(4.48)	0.347***	(4.26)
Foreign	-0.015	(-0.09)	-0.023	(-0.14)	0.001	(0.01)
InstOwn	-1.936	(-1.37)	-2.841*	(-1.81)	-1.186	(-0.91)
OwnCon	-1.232***	(-4.18)	-1.267***	(-4.29)	-1.189***	(-4.06)
Duality	-0.076	(-0.33)	-0.077	(-0.33)	-0.081	(-0.35)
Bmeet	-0.277***	(-4.86)	-0.276***	(-4.85)	-0.273***	(-4.76)
Bsize	0.017	(0.25)	0.010	(0.15)	0.019	(0.27)
Bindep	-0.130	(-1.57)	-0.136	(-1.63)	-0.122	(-1.47)
SBSize	-0.098	(-1.13)	-0.093	(-1.08)	-0.116	(-1.33)
Intercept	3.575***	(4.08)	3.033***	(3.26)	2.935***	(3.19)
Industry effect	Yes		Yes		Yes	
Region effect	Yes		Yes		Yes	
Pseudo R2	0.135		0.134		0.138	
Observations	8274		8274		8274	

Table 4: Stock market reactions to corporate fraud announcements (test of hypothesis H2)

This table presents tests of the stock market reaction to corporate fraud announcements. Our sample period covers 2003 to 2008. We use the sub-sample of firms with corporate fraud. The dependent variable is the cumulative abnormal return calculated as the firm-specific return less the market index return. Panel A applies the day 0 return and Panel B applies the cumulative return over a 5-day window (–2, +2). *NSOE* equals 1 if the firm is a non-state-owned enterprise and 0 otherwise. *Size* is firm size measured as the log of market capitalization. *Growth* is firm growth measured as the price-to-book ratio. *ST* equals 1 for firms under special treatment (i.e. those with two consecutive years of losses) and 0 otherwise. *Foreign* equals 1 if the proportion of shares held by foreign shareholders is above the yearly cross-sectional median and 0 otherwise. *InstOwn* equals 1 if the proportion of shares held by mutual funds is above the yearly cross-sectional median and 0 otherwise. *OwnCon* is ownership concentration, measured by the Herfindahl index and based on the ownership held by the ten largest shareholders in the firm. *Duality* equals 1 for firms with CEO also serving as board chairman and 0 otherwise. *Bmeet* equals 1 for firms with an above median number of board meetings and 0 otherwise. *Bsize* equals 1 for firms with board size above the cross-sectional median and 0 otherwise. *Bindep* equals 1 for firms whose proportion of independent directors is above the cross-sectional median and 0 otherwise. *SBsize* equals 1 for firms with supervisory board size above the cross-sectional median and 0 otherwise. Our t-statistics are adjusted for heteroskedasticity. *, **, and *** indicate the 10%, 5%, and 1% levels of significance respectively.

Panel A

	CAR[0]	Obs	CAR[-2,+2]	Obs
Combined sub-sample	-0.011	396	-0.017	338
SOE sub-sample	-0.007	238	-0.010	209
NSOE sub-sample	-0.017	158	-0.029	129
Difference	0.009 ***		0.019 ***	
t-stat	2.854		2.363	

Panel B

	CAR[0]		CAR[-2,+2]	
	coeff	t-stat	coeff	t-stat
NSOE	-0.012 **	(-2.56)	-0.022 *	(-1.79)
Size	0.000	(0.17)	0.016 **	(2.59)
Growth	0.000	(0.94)	0.000	(-0.25)
ST	0.005	(1.08)	0.018	(1.39)
Foreign	0.009	(0.76)	0.025	(1.45)
InstOwn	-0.092	(-1.35)	-0.285 *	(-1.85)
OwnCon	-0.023	(-1.22)	-0.050	(-1.02)
Duality	0.001	(0.08)	-0.025	(-0.96)
Bmeet	0.001	(0.27)	0.030 ***	(2.77)
Bsize	0.001	(0.15)	-0.015	(-1.09)
Bindep	0.002	(0.38)	-0.017	(-1.41)
SBSize	-0.003	(-0.44)	0.016	(0.85)
Intercept	-0.018	(-0.31)	-0.335 ***	(-2.68)
Industry clustering	Yes		Yes	
Adj R^2	-0.002		0.058	
Obs	267		225	

Table 5: Earnings performance following corporate fraud (test of hypothesis H3)

This table presents the analysis of earnings performance in the year following corporate fraud. Our sample period covers 2003 to 2008. We use the sub-sample of firms with corporate fraud. The dependent variable is raw earnings per share in Panel A and industry-median-adjusted earnings per share in Panel B. *NSOE* equals 1 if the firm is a non-state-owned enterprise and 0 otherwise. *Size* is firm size measured as the log of market capitalization. *Growth* is firm growth measured as the price-to-book ratio. *ST* equals 1 for firms under special treatment (i.e. those with two consecutive years of losses) and 0 otherwise. *Foreign* equals 1 if the proportion of shares held by foreign shareholders is above the yearly cross-sectional median and 0 otherwise. *InstOwn* equals 1 if the proportion of shares held by mutual funds is above the yearly cross-sectional median or 0 otherwise. *OwnCon* is ownership concentration, measured by the Herfindahl index and based on the ownership held by the ten largest shareholders in the firm. *Duality* equals 1 for firms with CEO also serving as board chairman and 0 otherwise. *Bmeet* equals 1 for firms with an above median number of board meetings and 0 otherwise. *Bsize* equals 1 for firms with board size above the cross-sectional median and 0 otherwise. *Bindep* equals 1 for firms whose proportion of independent directors is above the cross-sectional median and 0 otherwise. *SBsize* equals 1 for firms with supervisory board size above the cross-sectional median and 0 otherwise. Our t-statistics are adjusted for heteroskedasticity. *, **, and *** indicate the 10%, 5%, and 1% levels of significance respectively.

Panel A

	EPS	Obs	IndAdj EPS	Obs
Combined sub-sample	-0.116	381	-0.288	381
SOE sub-sample	0.075	199	-0.092	199
NSOE sub-sample	-0.326	182	-0.501	182
Difference	0.401***		0.409***	
t-stat	4.167		4.327	

Panel B

	EPS		IndAdj EPS	
	coeff	t-stat	Coeff	tstat
NSOE	-0.199***	(-2.96)	-0.209***	(-3.17)
Size	0.081**	(2.42)	0.067***	(2.12)
Growth	-0.009	(-1.50)	-0.010*	(-1.66)
ST	0.137*	(1.89)	0.123*	(1.77)
Foreign	-0.015	(-0.13)	0.019	(0.18)
InstOwn	4.128***	(2.97)	4.231***	(3.14)
OwnCon	0.295	(1.51)	0.274	(1.45)
Duality	0.145*	(1.74)	0.132	(1.61)
Bmeet	0.004	(0.06)	0.002	(0.02)
Bsize	0.002	(0.02)	0.012	(0.16)
Bindep	-0.013	(-0.17)	-0.028	(-0.37)
SBSize	-0.276***	(-2.99)	-0.251***	(-2.82)
Intercept	-1.439**	(-2.05)	-1.322**	(-1.99)
Industry clustering	Yes		Yes	
Adj R^2	0.116		0.114	
Obs	381		381	